

### **Amendments to the Claims**

Please cancel claims 1-14, without prejudice.

Please add new claims 19-55.

This listing of claims will replace all prior versions, and listings of claims in the application:

### **Listing of Claims:**

1-18. **(Cancelled)**

19. **(New)** A method comprising:

causing a subset of processing resources of a plurality of processing elements of a service processing switch to be allocated among a plurality of customers of a service provider by establishing a plurality of virtual routers (VRs) and assigning a subset of the VRs to the plurality of customers; and  
performing a profile-driven routing configuration of a customer virtual private network (VPN) of a first customer of the plurality of customers by  
programmatically determining a set of site reachability data corresponding to a plurality of sites of the first customer that are communicatively coupled to the service processing switch,  
logically dividing the customer VPN into a plurality of edge segments, a plurality of intra-VPN segments and a plurality of inter-VPN segments, the plurality of edge segments connecting the customer VPN to the plurality of sites and including virtual interfaces connected to logical interfaces and tunnel interfaces having remote ends outside the customer VPN, the plurality of intra-VPN segments providing connectivity among customer VRs of the plurality of VRs that are associated with the customer VPN, and the plurality of inter-VPN segments providing connectivity between the customer VPN and a service provider VPN,

receiving at a service management system associated with the service provider from a customer network management system associated with the first customer, a custom routing profile associated with the customer VPN, the custom routing profile identifying a first routing protocol to be used for the plurality of intra-VPN segments and a second routing protocol to be used for the plurality of edge segments, and the service management system automatically configuring the customer VPN by programmatically generating appropriate routing configurations for the customer VRs based on the set of site reachability data and the custom routing profile and provisioning the customer VRs.

20. **(New)** The method of claim 19, wherein the custom routing profile comprises information regarding one or more of the following:
  - routing administration status;
  - default site type; and
  - an Open Shortest Path First (OSPF) profile topology type.
21. **(New)** The method of claim 19, wherein the custom routing profile comprises a site profile.
22. **(New)** The method of claim 21, wherein the site profile includes a site type.
23. **(New)** The method of claim 21, wherein the site profile includes a set of one or more site subnets.
24. **(New)** The method of claim 19, wherein the custom routing profile is based upon a global routing profile.
25. **(New)** The method of claim 24, wherein the global routing profile includes a default routing protocol for the plurality of edge segments.
26. **(New)** The method of claim 19, further comprising disseminating the set of site reachability data to other routers within the customer VPN.

27. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises reading a set of subnets for a customer site of the plurality of sites of the first customer and creating static routes for the set of subnets.
28. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises placing the set of site reachability information in a directory and providing access to the directory via Lightweight Directory Access Protocol (LDAP).
29. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises use of a static configuration in which all subnets associated with the plurality of sites are manually configured into the customer VPN.
30. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises exchanging the set of site reachability data via a routing protocol.
31. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises conveying the set of site reachability data via Multiprotocol Label Switching Label distribution Protocol (MPLS LDP).
32. **(New)** The method of claim 26, wherein said disseminating the set of site reachability data comprises piggybacking the set of site reachability data on an Internet Protocol (IP) backbone routing protocol.
33. **(New)** The method of claim 19, wherein the custom routing profile comprises an Open Shortest Path First (OSPF) profile and wherein the OSPF profile includes a route aggregation policy.
34. **(New)** The method of claim 19, wherein the custom routing profile includes an area defining a set of VRs of the customer VRs, and wherein said

programmatically generating appropriate routing configurations for the customer VRs includes generating a routing configuration for each VR in the set of VRs.

35. **(New)** The method of claim 19, further comprising receiving a selection of one or more of the customer VRs to receive the programmatically generated routing configurations.
36. **(New)** The method of claim 19, wherein said programmatically generating appropriate routing configurations for the customer VRs further comprises auto-generation of static routes for the customer VPN.
37. **(New)** The method of claim 19, wherein the custom routing profile includes parameters relating to one or more of Internet Protocol Security (IPSec), LT2P, Point-to-Point Tunneling Protocol (PPTP), Generic Route Encapsulation (GRE) protocol and Multiprotocol Label Switching (MPLS).
38. **(New)** The method of claim 19, further comprising providing a plurality of fixed routing profiles that are offered to the plurality of customers by the service provider as part of various differentiated service packages.
39. **(New)**. The method of claim 38, wherein the various differentiated service packages include one or more of the following:
  - a first service package that permits a customer to configure OSPF for the plurality of intra-VPN segments and the plurality of edge segments;
  - a second service package that permits the customer to configure OSPF for the plurality of intra-VPN segments and Routing Information Protocol (RIP) for the plurality of edge segments; and
  - a third service packet that permits the customer to configure static routing for the plurality of intra-VPN segments and the plurality of edge segments.

40. **(New)** A method comprising:
- causing a subset of processing resources of a plurality of processing elements of a service processing switch to be allocated among a plurality of customers of a service provider by establishing a plurality of virtual routers (VRs) and assigning a subset of the VRs to the plurality of customers; and
  - performing a profile-driven routing configuration of each of a plurality of customer virtual private networks (VPNs) for the plurality of customers by for each of the plurality of customers and each of the plurality of customer VPNs:
    - programmatically determining a set of site reachability data for a plurality of sites of the customer that are communicatively coupled to the service processing switch,
    - receiving at a service management system associated with the service provider from a customer network management system associated with the customer, a custom routing profile associated with the customer VPN, the custom routing profile identifying one or more routing protocols to be used for segments of the customer VPN, and
    - the service management system automatically configuring the customer VPN by (i) programmatically generating appropriate routing configurations for associated customer VRs of the plurality of VRs based on the set of site reachability data and the custom routing profile and (ii) provisioning the customer VRs.
41. **(New)** The method of claim 40, wherein the custom routing profile is based upon a global routing profile.
42. **(New)** The method of claim 41, wherein the global routing profile includes a default routing protocol for a plurality of edge segments of the segments of the customer VPN.
43. **(New)** The method of claim 40, further comprising disseminating the set of site reachability data to other routers within the customer VPN.

44. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises reading a set of subnets for a customer site of the plurality of sites of the customer and creating static routes for the set of subnets.
45. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises reading a set of subnets for a customer site of the plurality of sites of the first customer and creating static routes for the set of subnets.
46. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises placing the set of site reachability information in a directory and providing access to the directory via Lightweight Directory Access Protocol (LDAP).
47. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises use of a static configuration in which all subnets associated with the plurality of sites are manually configured into the customer VPN.
48. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises exchanging the set of site reachability data via a routing protocol.
49. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises conveying the set of site reachability data via Multiprotocol Label Switching Label distribution Protocol (MPLS LDP).
50. **(New)** The method of claim 43, wherein said disseminating the set of site reachability data comprises piggybacking the set of site reachability data on an Internet Protocol (IP) backbone routing protocol.

51. **(New)** The method of claim 40, further comprising receiving an indication of one or more of the associated customer VRs to receive the programmatically generated routing configurations for each of the plurality of customers.
52. **(New)** The method of claim 40, wherein the custom routing profile comprises information regarding one or more of the following:
- routing administration status;
  - default site type; and
  - an Open Shortest Path First (OSPF) profile topology type.
53. **(New)** The method of claim 40, wherein the custom routing profile includes parameters relating to one or more of Internet Protocol Security (IPSec), LT2P, Point-to-Point Tunneling Protocol (PPTP), Generic Route Encapsulation (GRE) protocol and Multiprotocol Label Switching (MPLS).
54. **(New)** The method of claim 40, further comprising providing a plurality of fixed routing profiles that are offered to the plurality of customers by the service provider as part of various differentiated service packages.
55. **(New)**. The method of claim 40, wherein the various differentiated service packages include one or more of the following:
- a first service package that permits a customer to configure OSPF for intra-VPN segments and edge segments;
  - a second service package that permits the customer to configure OSPF for the intra-VPN segments and Routing Information Protocol (RIP) for the edge segments; and
  - a third service packet that permits the customer to configure static routing for the intra-VPN segments and the edge segments.